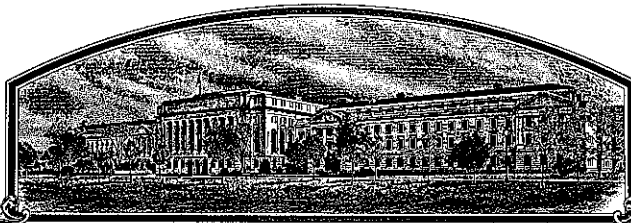


No.

9800221



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

NSH Research Foundation

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

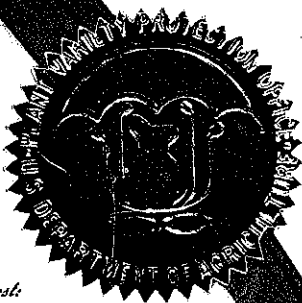
AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE SEED. (U.S. STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, DURUM

'Belzer'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of January, in the year of our Lord two thousand.



Attest:

Mrs. Marie Thro

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Stan Glidman

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

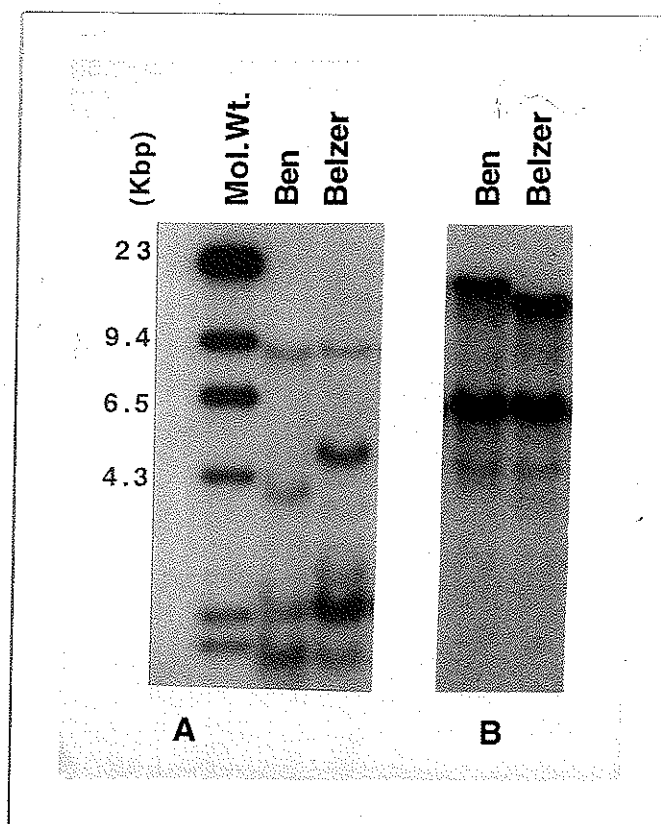
(Instructions and information collection burden statement on reverse)

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) NDSU Research Foundation		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER D87240	3. VARIETY NAME Belzer
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) c/o Executive Director PQ Box 5014 Fargo, ND 58105-5014		5. TELEPHONE (include area code) 701-231-8931	FOR OFFICIAL USE ONLY PVPO NUMBER 9800221
		6. FAX (include area code) 701-231-1013	
7. GENUS AND SPECIES NAME Tritium turgidum L.	8. FAMILY NAME (Botanical) Gramineae		FILING DATE 04/29/1998
9. CROP KIND NAME (Common name) Durum wheat			FILED DATE 04/29/1998
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name) NDSU Research Foundation 501 (c) (3) Corporation			CERTIFICATION FEE: \$ 300
11. IF INCORPORATED, GIVE STATE OF INCORPORATION North Dakota		12. DATE OF INCORPORATION May 1989	DATE 8/11/99
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Elias Elias Department of Plant Sciences North Dakota State Univ. PQ Box 5051 Fargo, ND 58105-5051 Dale Zetocho Executive Director NDSU Research Foundation PQ Box 5014 Fargo, ND 58105-5014			14. TELEPHONE (include area code) 701-231-8159
			15. FAX (include area code) 701-231-8474
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)			
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 33(a) of the Plant Variety Protection Act) <input checked="" type="checkbox"/> YES (If "yes," answer items 18 and 19 below) <input type="checkbox"/> NO (If "no," go to item 20)			
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES (If "yes," give names of countries and dates) <input type="checkbox"/> NO USA - Release date - July 14, 1997			
21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s)) Dale Zetocho		SIGNATURE OF APPLICANT (Owner(s))	
NAME (Please print or type) Dale Zetocho		NAME (Please print or type)	
CAPACITY OR TITLE Executive Director NDSU Research Foundation	DATE 4/28/98	CAPACITY OR TITLE	DATE

EXHIBIT B - NOVELTY STATEMENT

To my knowledge, Belzer most nearly resembles Ben durum wheat. Ben and Belzer durum wheat can be unambiguously differentiated by molecular markers. Restriction fragment length polymorphism (RFLP) analysis using clones Fbb82 and BCD809 detected polymorphisms between Ben and Belzer.

Figure 1. RFLP analysis of genomic DNA showing restriction fragment size polymorphism between Ben and Belzer. Panel A Autoradiogram of Ben and Belzer *Hind* III-digested DNA hybridized with clone Fbb82. Polymorphism is shown by the presence of a 3.9 kilobasepairs DNA fragment present in Ben and a 4.8 kilobasepairs DNA fragment in Belzer. Panel B Autoradiogram of clone BCD809 hybridized with *EcoR* I digested genomic DNA, showing a 19 kilobasepairs DNA fragment present in Ben and a 17 kilobasepairs DNA fragment in Belzer.



Materials and Methods

Genomic DNA extraction, restriction endonuclease digestion, and Southern blotting were described in Riede and Anderson (1996). RFLP clones were obtained from Mark Sorrells at Cornell University (BCD Clone) and Philippe Leroy at Institute National de la Recherche Agronomique (Fbb clone). Both clones were known to hybridize to low-copy DNA sequences. The procedure was repeated twice to confirm results.

Riede, C.R., and J.A. Anderson. 1996. Linkage of RFLP markers to an aluminium tolerance gene in wheat. *Crop Sci.* 36:905-909.

EXHIBIT A - ORIGIN AND BREEDING HISTORY

'BELZER'

Fall 1983 Original cross made at North Dakota State University (NDSU) greenhouse.
Pedigree - D7798/DT367
D7798 - D71110/Edmore
D71110 - D6580/Ward
D6580 - Lakota/DwF4-Ldn//Leeds
DT367 - is registered as high yielding durum wheat germplasm in 1991 Crop Sci. 31:1394. Reg. no. GP-328, PI 546060.

Spring 1984 F₁ plants, NDSU greenhouse.

Summer 1984 F₂ plants, NDSU research land.

Summer 1985 F₃ head rows, NDSU research land.

Summer 1986 F₄ head rows, NDSU research land.

Summer 1987 F₅ head rows, NDSU research land.

Summer 1988 F₆ preliminary yield trail, two locations, NDSU research land.
Experimental line designation - D87240.

Summer 1989 F₇ Advanced yield trial, two locations, NDSU research land.

Summer 1990 F₈ Elite yield trial, three locations, NDSU research land.

Summer 1991 F₉ Uniform Regional Durum Nursery, 15 locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.

Summer 1992 F₁₀ Uniform Regional Durum Nursery, 15 locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.

Summer 1993 F₁₁ Uniform Regional Durum Nursery, 15

locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.

Summer 1994	Uniform Regional Durum Nursery, 15 locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.
Summer 1995	Uniform Regional Durum Nursery, 15 locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.
Summer 1996	Uniform Regional Durum Nursery, 13 locations, North Dakota, South Dakota, Minnesota, Montana, and Canada.
Summer 1996	Seed increase by Seedstocks Project.
July 14, 1997	D87240 was released as a named cultivar, Belzer.
Summer 1997	Second seed increase by Seedstocks Project.

Belzer was observed for eleven generations from 1987 to 1997 and was shown to be stable and uniform. Belzer has been rogued at the F_5 and subsequent generations. The frequency of rogued plants in each generation was less than 1/1000 plants. No variants were found in the variety Belzer.

The pedigree breeding method was used to develop Belzer. In early generations F_2 - F_4 high heritable traits such as plant height, maturity, and disease resistance were selected. Starting at F_5 generation, selection criteria also included grain yield, test weight, kernel weight, and pasta quality traits (i.e., protein content, gluten strength, milling extraction, spaghetti color, cooking quality, etc.). Based on data from multiple locations and years Belzer was selected for its high yield, large kernel size, gluten strength, and moderate resistance to *Fusarium* head blight (*Fusarium spp*).

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

~~North Dakota State University~~ Research Foundation

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

Box 5014
Fargo, ND 58105-5014

FOR OFFICIAL USE ONLY

PVPO NUMBER 9800221

VARIETY NAME OR TEMPORARY DESIGNATION	Belzer
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Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. **089** or **09**) when number is either 99 or less or 9 or less.

1. KIND:

2 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2 TYPE,

1 1 = SPRING 2 = WINTER 3 = OTHER (Specify) _____ 1 = SOFT 3 = OTHER (Specify)
2 = HARD - Amber

3 1 = WHITE 2 = RED 3 = OTHER (Specify) Amber

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

	6	1	FIRST FLOWERING		6	5	LAST FLOWERING
--	---	---	-----------------	--	---	---	----------------

4. MATURITY (50% Flowering):

0 0 NO. OF DAYS EARLIER THAN 6 1 = ARTHUR 2 = SCOUT 3 = CHRIS
 NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINE 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

	9	4	CM. HIGH
--	---	---	----------

0	1	CM. TALLER THAN	6
---	---	-----------------------	---

☐ ☐ CM. SHORTER THAN ☐

1 = ARTHUR	2 = SCOUT	3 = CHRIS
4 = LEWHI	5 = NUGAINE	6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

2 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM₂

1 Anthocyanin: 1 = ABSENT 2 = PRESENT

1 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

0	4	NO. OF NODES (Originating from node above ground)
---	---	---

2 Waxy bloom: 1 = ABSENT 2 = PRESENT

Internodes: 1 = HOLLOW 2 = SOLID

1	9	CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW
---	---	---

9. AURICLES:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT

1 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

1 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED
3 = OTHER (Specify): _____

1 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

1	1	MM. LEAF WIDTH (First leaf below flag leaf)
---	---	---

1 Flag leaf: 1 = NOT TWISTED 2 = TWISTED

1 Vary bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

2	0	CM. LEAF LENGTH (First leaf below flag leaf):
---	---	---

9800221

Summary of quality evaluations for Belzer grown at 36 location/years in field plots (1991 through 1996).

Genotype	Protein			Extraction			Kernel Size	
	Wht.	Sem.	Max	Sd	Tot.	Sem.	% L	% S
Belzer	14.5	13.8	6.9	57	68.5	59.3	51	2
Ben	14.5	13.7	6.3	44	69.2	60.1	57	2
Munich	14.4	13.7	5.2	40	69.6	60.2	41	3
Sceptre	14.3	13.6	5.9	43	69.2	60.0	42	3
Renville	14.4	13.6	5.8	41	69.9	60.7	32	5
Monroe	14.3	13.5	6.1	42	69.5	60.3	54	2
Vic	14.5	13.8	5.7	41	69.4	59.8	50	2
Medora	14.8	14.0	6.0	46	69.1	60.0	44	3
Rugby	14.4	13.5	3.0	24	69.2	60.3	43	3
Lloyd	14.2	13.3	6.1	45	68.5	59.2	36	5

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

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EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) NDSU Research Foundation	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER D87240	3. VARIETY NAME Belzer
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) c/o Executive Director PO Box 5014 Fargo, ND 58105-5014	5. TELEPHONE (include area code) 701-231-8931	6. FAX (include area code) 701-231-1013
7. PVPO NUMBER 9800221		

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain.

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?
If no, give name of country

☒ YES ☐ NO

10. Is the applicant the original owner? ☐ YES ☒ NO If no, please answer the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☒ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company, is the original owner(s) a U.S. based company?

☒ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (If needed, use reverse for extra space):

See additional Exhibit E Statement of the Basis of the Applicant's Ownership included in the application.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-5881 (voice) or (202) 720-7808 (TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

EXHIBIT E - STATEMENT OF THE BASIS OF THE APPLICANT'S OWNERSHIP

Dr. Elias M. Elias, an employee of the North Dakota Agricultural Experiment Station and North Dakota State University, is a plant breeder who developed 'Belzer' the durum wheat cultivar for which Plant Variety Protection is hereby sought. The employee by agreement and because of the condition of the use of facilities and funds of the North Dakota Agricultural Experiment Station and North Dakota State University has assigned all ownership rights to 'Belzer' durum wheat to the North Dakota Agricultural Experiment Station and North Dakota State University.

North Dakota State University on behalf of the North Dakota Agricultural Experiment Station has assigned all ownership to the NDSU Research Foundation. The NDSU Research Foundation is a nonprofit corporation set up to own and manage the intellectual property of North Dakota State University.

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WILSON